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(54) Title: OLIGOMERISATION PROCESS AND CATALYST SYSTEM

(57) Abstract: The invention provides a catalyst system for the oligomerisation of olefins, which catalyst system is prepared from catalyst components selected from the group including at least a chromium source, a substituted phenol, and an organoaluminium compound. The invention further provides an aromatic ether component for a trimerisation catalyst system and an oligomerisation process using said catalyst.

**AMENDED CLAIMS**

[received by the International Bureau on 12 February 2003 (12.02.03);  
original claims 1-8 and 18-26 replaced by amended claims 1-8 and 18-26 (2 pages)]

1. A catalyst system for the oligomerisation of olefins, which catalyst system is prepared from catalyst components, which components include at least a chromium source, a substituted phenol, and an organoaluminium compound.
2. A catalyst system as claimed in claim 1, which catalyst system is suitable as an ethylene trimerisation catalyst system.
- 10 3. A catalyst system as claimed in any one of the preceding claims, wherein the substituted phenol is a di-substituted phenol.
4. A catalyst system as claimed in any one of the preceding claims, wherein the substituted phenol is a di-aryl-substituted phenol.
- 15 5. A catalyst system as claimed in any one of the preceding claims, wherein the substituents on the phenol are linear or branched hydrocarbon groups containing 1 to 30 carbon atoms.
- 20 6. A catalyst system as claimed in any one of the preceding claims, wherein the organoaluminium compound is an alkyl aluminium compound.
7. A catalyst system as claimed in any one of the preceding claims, wherein the organoaluminium compound is in the form  $\text{Al}(\text{R})_3$  in which R is a linear or  
25 branched hydrocarbyl group having from 1 to 6 carbon atoms.
8. A catalyst system as claimed in any one of the preceding claims, wherein the substituted phenol is 2,6-diphenylphenol.

18. A process for the trimerisation of ethylene to 1-hexene, said process including the contacting of an ethylene containing stream under oligomerisation reaction conditions with a catalyst system which is prepared from catalyst components, which components include at least a chromium source, a substituted phenol, and an organoaluminium compound, said process being carried out in a desired temperature range of 100°C to 140 °C.

19. A process as claimed in claim 18, wherein the catalyst components from which the catalyst system is prepared include an aromatic ether.

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20. A process as claimed in claim 19, wherein the process is carried out at a temperature of 117°C to 125°C.

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21. A process as claimed in claim 20, wherein the process is carried out at a temperature of 120°C.

22. A process as claimed in any one of claims 18 to 20, which is carried out at a pressure of above 10 Barg.

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23. A process as claimed in any one of claims 18 to 22, which is carried out at a pressure of above 20 Barg.

24. A process as claimed in claim 23, which is carried out at a pressure of above 30 Barg.

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25. A process as claimed in any one of claims 18 to 24, in which the catalyst system is present at an elemental chromium concentration, of less than 0.1 mmol/100ml.

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26. A process as claimed in any one of claims 18 to 25, wherein the process is performed by the introduction of an ethylene feedstock into a reactor with the